# ThermoLite™ 100W-300W Solar Panel Installation Guide

## General Installation Precautions and Specifications

***WARNING: Always wear safety glasses and protective gloves when working with batteries. Your company may require additional PPE. Consult your company safety policy and requirements prior to installation of this product.***

***NOTE: This equipment is designed and rated for 12V DC nominal systems.***

The solar panel, application surface and air temperature must all be above 45 F (1.3 C).

For best results when applying the panel adhesive, ensure the surface is completely clean using Isopropal alcohol or appropriate de-greasers. Ensure all cleaning residue is removed and the surface is dry.

- The adhesive backing is very aggressive and is difficult to remove once installed.
- Always ensure the solar panel fuse (located on the positive battery harness) is removed during installation or service.
- Always locate the charge controller near the unit's battery to avoid voltage loss in the cable.

## 100W Base kit Installation

1. Turn off the refrigeration unit and any accessory equipment including standby power connection to the truck or tractor.
2. Disconnect the negative battery cable of the refrigeration unit and any accessory battery packs used for lift gate or other auxiliary equipment.
3. Temporarily remove fuse from solar panel harness.
4. Panel installation location on the truck/trailer can be either the front or the back. Factors to be considered are:
   a. If reefer unit is present with existing two-pole (two wire) connections with a wire gauge of 12 AWG or larger to the liftgate batteries, then the panels should be installed on the roof of the trailer near the front to utilize the existing connections **(Figure 1)**.
   b. Front of the trailer installations are generally preferred so vehicles parked against a building will not shade the panels and reduce performance
   c. Consider installing the panels away from tractor and unit exhaust. The panel may be positioned length wise or perpendicular to the trailer roof edge. Exhaust soot build-up on the panel can result in decreased performance of the panel if not cleaned.
   d. The junction boxes should be positioned closest to the edge of the trailer end and lined up with the planned wire route.
   e. If snow scrapers are to be used for winter snow removal, position the panel with the long edge containing the junction box aligned to the front edge of the trailer so the sloped edge of the junction box is facing forward **(Figure 2)**.

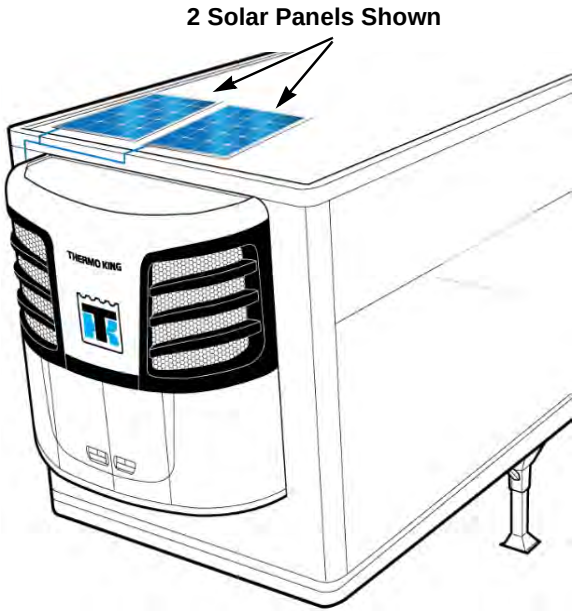


Figure 1

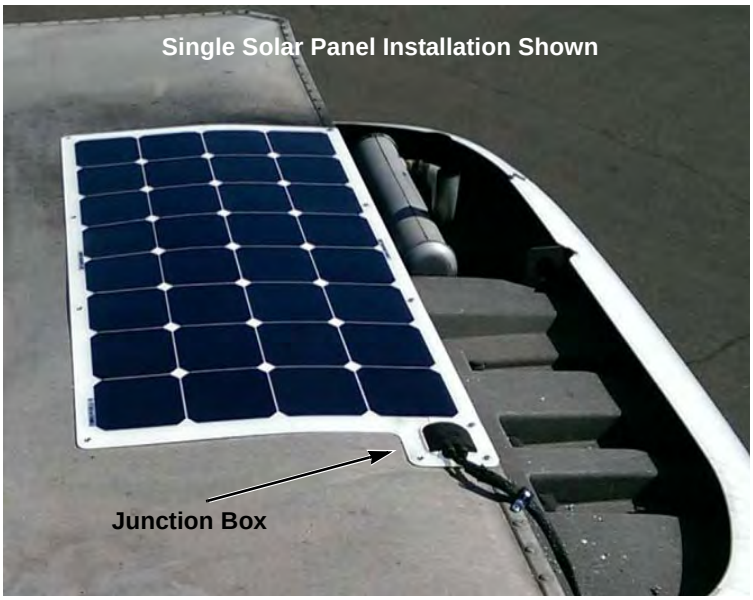


Figure 2

f. If the battery box is located at the very rear of the trailer, the panels could be located at the rear trailer with protected cable routing down the back **(Figure 3)**.


Figure 3

5. Plan the panel layout and wire routing prior to permanently mounting any equipment. Familiarize yourself with the components to be installed **(Figure 4)**. Make sure wire routes are free from abrasive materials and have adequate clearance from hot surfaces. Any holes through metal frames, skins or structures should be smooth and non-marring or be lined with a grommet prior to routing wires.

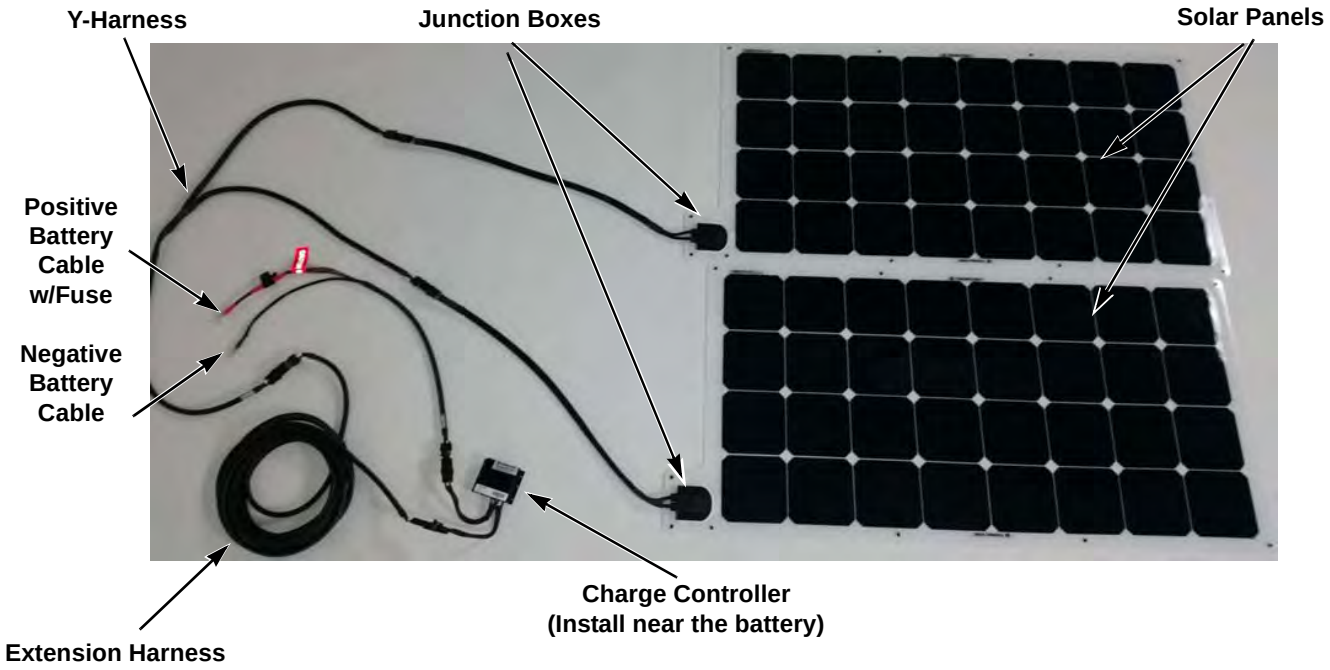


**Figure 4**

6. Ensure the top surface of the installation location is clean and free of any dirt. Suggested cleaners: Isopropal alcohol, de-greaser. If needed, use a scouring pad to remove built-up oxides and residue. Ensure all cleaning residue is removed and surface is dry and above 45 F / 1.3 C **(Figure 5)**.

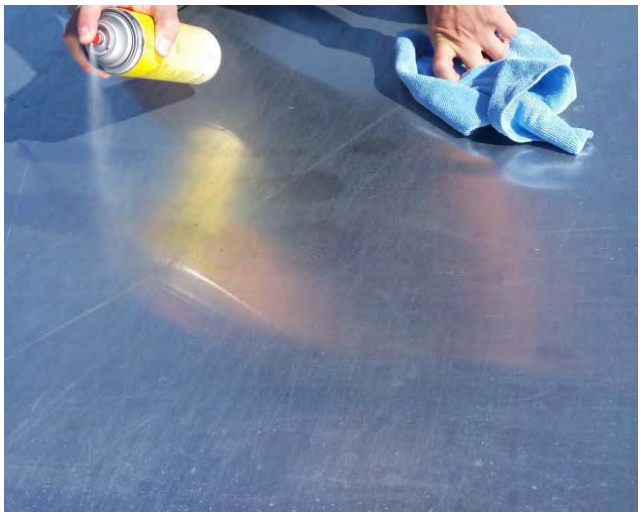

**Figure 5**

7. Peel back the adhesive backing and apply the panel edge with the Junction Box near the outer edge of the trailer to utilize any existing rivet strips for mechanical fastening and to minimize harness routing on the top of the truck/trailer.

8. With the panel properly positioned, remove the remainder of the adhesive backing and firmly press the panel down over the entire area. Ensure the entire panel is properly adhered to the surface. This is critical to prevent moisture between the surfaces **(Figure 6)**.

**Figure 6**

9. Mechanical fasteners used to anchor panel can also include the use of p-clamps to anchor cables as needed. Defer the steps 10 & 11 until after cable installation if that is the case.

10. Use the provided self tapping screws or rivets to anchor the panel through the panel grommets into any exterior rivet strips that will not compromise the integrity of the trailer roof. Not all panel grommets need anchors **(Figure 7)**.

    a. Use sealant and cover completely the bottom of all rivets or screws used in install. No metal should be exposed.

**Figure 7**

11. If additional panels are being installed follow steps 5- 10 above and repeat to co-locate all panels.

    a. Utilize the y-cables to connect multiple panels together in parallel.

    b. A maximum of three 100 W panels can be connected in parallel

12. Secure any excess cable off of the roof if possible. Any rooftop cables should be secured using mechanical fasteners, p-clamp anchors or high-bond adhesives.

13. The extension harnesses are provided with one non-plugged end and a loose connector housing. Verify the polarity of the cable to the panel and charge controller prior to routing the wire. Plan your route and route the wiring starting with the non-plugged end.
14. Route the extension harness down the front or back of the trailer and through any existing conduits if possible.
    a. Add grommets to holes in frame or skins as needed to protect wiring.
    b. Route towards the battery box or connections to the batteries to be charged using existing cables.
15. Verify that any existing cables used meet or exceed the wire gauge of the wiring supplied with the solar panels.
    a. Do not route the cable next to any heat sources or any sharp edges without adequate clearance or additional cable protection.
    b. If the cables are routed through new or existing holes in metal structures, grommets (installer provided) must be used to protect the cables.
16. Secure the charge controller near the batteries or adjacent to the existing two pole front of trailer connection points using mechanical fasteners **(Figure 8)**.

**Figure 8**

17. Once the wiring is in place, take the loose connector end provided and plug the black wire into position “A” and the white wire into position “B”.
    a. Pull back slightly on the wire after hearing a “click” to make sure the terminal is properly seated.
    b. Fold the retainer clip onto the back of the connector until you hear a “click”. Make sure the retainer clip is secured.
18. Connect the extension harness to the charge controller.
19. Connect the battery terminal harness to the charge controller and route the white/red wire to the positive terminal on the battery or to the two pole connection location. If existing wiring is to be utilized it must meet or exceed the 12 AWG wire gauge of the wiring supplied with the solar panels.

***NOTE: If the existing wiring quality or gauge is in question, add additional new solar panel extension cables as needed and route the panel wiring to the battery box location and install the charge controller and battery harness at the battery box location as seen in Figure 7.***

20. Attach the black wire to the negative ground of the battery or to a common ground stud or terminal.
21. Install fuse in solar wire harness.

22. Reconnect negative battery connections.
23. Verify that the solar panels are charging the batteries by moving the unit into the sunlight and measuring the current on the solar wire harness using a clamp-on DC Ammeter. The charge controller may take up to one minute to turn on and requires the battery voltage to be at 12.3 V or lower to start a charging cycle. Activating the equipment running off the battery will drop the battery voltage to this level and start the charging cycle.
24. Install the yellow Caution label **(Figure 9)** on the liftgate battery box or near the solar panel terminal connection. The label must be visible to servicing technicians to warn of additional charging sources.


**Figure 9**